

What is claimed is:

1. A radar mount direction alignment device to be used for aligning a transmit/receive direction of a radar device mounted on a member on which the radar device is to be mounted, the device comprising:

a receiving section for receiving a signal emitted from the radar device;

a transmission section for transmitting a signal to the radar device; and

first means for transmitting, toward the radar device, a signal which, when the signal emitted from the radar device is received, behaves as if having been reflected from a reflection target disposed at a position farther from the radar device than a distance between the radar device and the radar mount direction alignment device.

2. A radar mount direction alignment device, further comprising:

second means for providing a predetermined delay time for the signal received by the receiving section.

3. The radar mount direction alignment device according to claim 1, further comprising:

a transmission line for transmitting a signal, wherein a predetermined signal is transmitted toward the radar device

after a received signal has been transmitted over the transmission line.

4. The radar mount direction alignment device according to claim 3, wherein the transmission line is a member selected from the group consisting of a waveguide, a dielectric line, and an optical fiber.

5. The radar mount direction alignment device according to claim 3, further comprising:  
a reflector which reflects a signal entered from one end of the transmission line, at the other end of the transmission line,

wherein the reflected signal exits from the one end of the transmission line.

6. The radar mount direction alignment device according to claim 5, further comprising:

an antenna or lens disposed in an entrance of the transmission line.

7. The radar mount direction alignment device according to claim 3, wherein the signal having entered from one end of the transmission line exits from the other end of the transmission line.

8. The radar mount direction alignment device according to claim 7, further comprising:

an antenna or lens disposed at an entrance and/or exit of the transmission line.

9. The radar mount direction alignment device according to claim 1, further comprising:

an amplifier for amplifying a received signal.

10. The radar mount direction alignment device according to claim 1, further comprising:

a branching device for branching a received signal into a plurality of signals,

wherein the respective signals into which the received signal is branched are transmitted toward the radar device.

11. The radar mount direction alignment device according to claim 10, wherein, when the radar mount direction alignment device has the amplifier, the amplifier is disposed upstream of the branching device.

12. A radar mount direction alignment method for aligning a transmit/receive direction of a radar device, the device being mounted on a member on which a radar unit is to be mounted,

the device having a relative angle sensor for sensing a relative angle with reference to a target, the method comprising:

disposing a transmission section at a predetermined position;

detecting an angle relative to the transmission section by the relative angle sensor;

detecting an angle relative to the receiving section detected by the relative angle sensor; and

aligning the transmit/receive direction of the radar device in accordance with the angle relative to the transmission section the angle relative to the receiving section.

13. The method of aligning a radar mount direction according to claim 12, wherein a plurality of radar mount direction alignment devices are adopted; and

a plurality of transmission sections are disposed at different positions.

14. A radar mount direction alignment method of aligning a transmit/receive direction of a radar device, the device being mounted on a member on which a radar unit is to be mounted, the device having a signal intensity sensor for receiving a signal reflected from a target and detecting the intensity of the receiving signal, the method comprising:

placing a transmission section at a predetermined

position;

detecting the intensity of the signal by the signal intensity sensor; and

aligning a transmit/receive direction of the radar device in accordance with the intensity of a signal transmitted from the transmission section.

15. The radar mount direction alignment method according to claim 14, wherein a plurality of radar mount direction alignment devices are adopted; and

a plurality of transmission sections are placed at different positions.

16. A radar mount direction alignment method of aligning a transmit/receive direction of a radar device, the device being mounted on a member on which a radar unit is to be mounted, the device having a signal intensity sensor for detecting the intensity of a signal received from the outside, the method further comprising:

placing a plurality of transmission sections each for transmitting branched signals at different predetermined positions;

detecting the intensity of the signal by the signal intensity sensor; and

aligning a transmit/receive direction of the radar device

in accordance with the intensity of signals transmitted from the transmission sections.

17. The radar mount direction alignment method according to claim 16, wherein the transmit/receive direction of the radar device is aligned in consideration of a difference in sensitivity in detection of the intensity of signals output from the transmission sections which are susceptible to the influence of distance.

18. The radar mount direction alignment method according to claim 17, wherein, when the radar device is equipped with a relative distance sensor for detecting a distance relative to a target, the sensitivity difference determined on the basis of a relative distance detected by the relative distance sensor is utilized.

19. The radar mount direction alignment method according to claim 17, wherein there is utilized the sensitivity difference that has been determined on the basis of information about a sensitivity difference which has been measured in advance and corresponds to a distance relative to the target.

20. A radar mount direction alignment method for aligning a transmit/receive direction of a radar device, the

device being mounted on a member on which a radar unit is to be mounted, the device having a relative angle sensor for detecting a distance relative to a target, the method comprising:

disposing a reflection target at a predetermined location;

detecting an angle relative to the reflection target by the relative angle sensor; and

aligning the transmit/receive direction of the radar device in accordance with the angle relative to the reflection target.

21. The radar mount direction alignment method according to claim 20, wherein the transmit/receive direction of the radar device is aligned such that the angle relative to the target assumes a predetermined angle.

22. The radar mount direction alignment method according to claim 20, wherein the predetermined position is set on substantially a center axis in a sensing area of the radar device.

23. The radar mount direction alignment method according to claim 20, wherein the predetermined position is set on substantially a line connecting the location of a target for alignment with a position at which the radar device is to

be mounted.

24. The radar mount direction alignment method according to claim 20, wherein, when the radar device is to be aligned in an azimuth plane, the target is provided in the azimuth plane; or when the radar device is to be aligned in an elevation plane, the reflection target is provided in the elevation plane.

25. The radar mount direction alignment method according to claim 20, wherein a plurality of reflection targets are disposed at different locations.

26. The radar mount direction alignment method according to claim 25, wherein the reflection targets are disposed at positions where signals reflected from the reflection targets exert no influence on each other.

27. The radar mount direction alignment method according to claim 25, wherein the transmit/receive direction of the radar device is aligned in consideration of a difference in sensitivity for detection of the intensity of reflected signals which are susceptible to the influence of distance.

28. The radar mount direction alignment method



according to claim 27, wherein, when the radar device is equipped with a relative distance sensor for detecting a distance relative to a target, there is utilized the sensitivity difference determined on the basis of a relative distance detected by the relative distance sensor.

29. A radar device having a reflection sensitivity sensor for detecting the intensity of a signal reflected from a target and a relative distance sensor for detecting a distance relative to the target, the radar device comprising:

a detection sensitivity difference calculation device for calculating a difference in the sensitivity in detection of the intensity of a reflected signal which is susceptible to the influence of a distance, on the basis of a distance relative to the target detected by the relative distance sensor.

30. The radar device according to claim 29, further comprising:

a memory for storing information about a sensitivity difference which has been determined beforehand and corresponds to a distance relative to the target,

wherein the sensitivity difference calculation device determines a difference in sensitivity for detection of intensity of a reflected signal which is susceptible to the influence of distance, on the basis of a distance relative to

the target detected by the relative distance sensor and of the information stored in the memory.

31. A radar mount direction alignment method for aligning a transmit/receive direction of a radar device which is mounted on a member on which a radar device is to be mounted, such as a vehicle, and has a beam scanning function, the method comprising:

disposing a receiving section for receiving a signal emitted from the radar device at a predetermined position; and

detecting a change in the level of a signal received by the receiving section as a result of beam scanning; and

aligning the transmit/receive direction of the radar device in accordance with the change in the level of the signal.

32. The radar mount direction alignment method according to claim 31, wherein a signal is emitted from the radar device toward a center direction of beam scanning.

33. The radar mount direction alignment method according to claim 31, wherein the transmit/receive direction of the radar device is aligned such that the level change assumes a desired level change.

34. The radar mount direction alignment method

according to claim 33, wherein the transmit/receive direction of the radar device is aligned such that the level change becomes smaller.

35. The radar mount direction alignment method according to claim 31, wherein the transmit/receive direction of the radar device is aligned with regard to a level change, through use of information about at least one end of scan direction.

36. The radar mount direction alignment method according to claim 31, wherein the transmit/receive direction of the radar device is aligned with regard to a level change without use of information about ends of scan direction.

37. The radar mount direction alignment method according to claim 31, wherein the transmit/receive direction of the radar device is aligned with regard to a level change through use of amplitude information.

38. The radar mount direction alignment method according to claim 31, wherein a plurality of receiving sections are provided at different positions.

39. The radar mount direction alignment method according

to claim 31, wherein an unmodulated transmission wave signal is emitted from the radar device.

40. A radar mount direction alignment device comprising:

a receiving section for receiving a signal; and  
a converter for converting the frequency of the signal into a lower frequency.

41. A radar mount direction alignment device comprising:

a receiving section for receiving a signal; and  
a measurement instrument for measuring a receiving level from the signal through use of an FFT system.

42. A radar mount direction alignment adjusting device for a radar being mounted on a vehicle and emitting a signal, the radar mount direction alignment adjusting device comprising:

a first reflection unit including:

a first antenna for receiving the signal from the radar and transmitting the signal toward the radar;

a first transmission line for transmitting the signal received by the first antenna;

a first attenuator for attenuating the signal from

the first transmission line by a first predetermined ratio; and

a first reflector for reflecting the signal from the first attenuator; and

a second reflection unit including:

a second antenna for receiving the signal from the radar and transmitting the signal toward the radar;

a second transmission line for transmitting the signal received by the second antenna;

a second attenuator for attenuating the signal from the second transmission line by a second predetermined ratio; and

a second reflector for reflecting the signal from the second attenuator,

wherein the length of the first transmission line is different from the that of the second transmission line.

43. The radar mount direction alignment adjusting device as claimed in claim 42, wherein the signal reflected by the first reflector is transmitted through the first attenuator and the first transmission line to the first antenna and outputted toward the radar; and

the signal reflected by the second reflector is transmitted through the second attenuator and the second transmission line to the second antenna and outputted toward

the radar.

44. The radar mount direction alignment adjusting device as claimed in claim 42, wherein the first predetermined value of the first attenuator and the second predetermined value of the second attenuator are determined in accordance with the length of the first transmission line and the length of the second transmission line.

45. The radar mount direction alignment adjusting device as claimed in claim 42, wherein the first antenna of the first reflection unit and the second antenna of the second reflection unit are spaced with a same distance from a horizontal surface including the scanning direction of the radar.

46. The radar mount direction alignment adjusting device as claimed in claim 42, wherein the first antenna of the first reflection unit and the second antenna of the second reflection unit are spaced with a same distance from the radar.

47. The radar mount direction alignment adjusting device as claimed in claim 43, wherein the mount direction of the radar is adjusted in accordance with the signals received from the first reflection unit and the second reflection unit.

48. A method for adjusting alignment of a mount direction of a radar, the method comprising:

receiving a signal from the radar by a first reflector;

transmitting a first signal from the first reflector to the radar, the signal corresponding to a first distance;

receiving the signal from the radar by a second reflector;

transmitting a second signal from the second reflector to the radar, the second signal corresponding to a second distance; and

adjusting the alignment of the radar in accordance with the first signal and the second signal.